



Tri Team Attack (9) – Round 1

Tri-Team Attack (9)

20 minutes, 20 questions

Rules

This is Round 1 of Tri-Team Attack, which consists of two 20-minute sessions with 20 questions per session and a short break in between. These problems are designed to be time-consuming and collaborative. Calculators are permitted. After solving a problem, a team member will submit the answer for verification. The first three correct answers will receive a red card worth 5 points. The next three will receive a blue card worth 3 points. The next three will receive a green card worth 2 points. The next three will receive a yellow card worth 1 point. If a team gets an answer wrong, they may try it again, but they must return to their table first – they may not remain at the scoring table.

As each correct answer card is collected, a tally will be displayed indicating the number of correct answers that have been submitted. This tally will be displayed on an overhead to help teams determine their strategy in their pursuit of correct answers and maximum points. Students may work only with their teammates from the same school. No other collaboration is allowed. Units are NOT necessary.

Names _____ Grade _____

_____ Grade _____

_____ Grade _____

School _____



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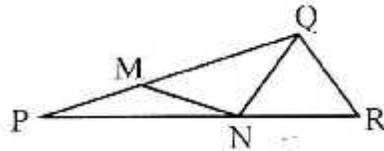
- Find n such that $3^5 \cdot 4^4 \cdot 5^3 \cdot n = 15!$
- In the 2016 Rio Olympics, a total of 972 medals were awarded to 87 different countries. The top three medal winners are shown

	Gold	Silver	Bronze
USA	46	37	38
Great Britain	27	23	17
China	26	18	26

What is the average number of medals awarded to the remaining 84 countries? Write your answer as a decimal rounded to the nearest tenth.

- In how many ways can 9 mathletes be divided into three Tri-Team Attack teams of three players each, assuming that the order in which teams are chosen is irrelevant?

- In triangle PQR, $PM = MN = NQ = QR$, and $m\angle PQR = 140^\circ$. What is the degree measure of $\angle R$? (Note: Figure not to scale).



- Suppose $A^B = B^A$. Compute $(3^1)^2$ and $(2^4)^3$.

- If $f(x) = x^3 - 13$ and $g(x) = \frac{1}{x}$, what is the value of k if $g(f(k)) = 16$?

- If yesterday was Wednesday, what day of the week will it be 2017 days from now?



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8. Maizee Blue has only yellow socks and blue socks. She puts 8 yellow socks and 5 blue socks in the dryer. If Maizee pulls two socks out of the dryer at random, what is the probability that both socks are the same color? Write your answer as a common fraction in simplest form.

9. Two window washers can wash all the windows of a skyscraper in 12 hours. The faster window washer can wash all the windows of the same skyscraper in 20 hours alone. How long would the slower window washer take to wash the same windows working alone?

10. What is the sum of the number of vertices, edges, and faces of a pentagonal prism?

11. Find the missing value:

$$\begin{array}{c} 2 \quad 2 \\ \square \\ 1 \quad 2 \end{array} \quad \begin{array}{c} 3 \quad 1 \\ \square \\ 4 \quad 1 \end{array} \quad \begin{array}{c} 4 \quad 2 \\ \square \\ 2 \quad 2 \end{array} \quad \begin{array}{c} 1 \quad 2 \\ \square \\ 3 \quad 3 \end{array} \quad \begin{array}{c} 2 \quad 2 \\ \square \\ 1 \quad 4 \end{array}$$

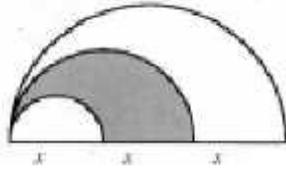
12. Given that A(-4, -6) and B(7, 1) are the endpoints of a line segment, what is the sum of the coordinates of the midpoint of the segment?

13. Five positive integers have a mean of 13. What is the largest possible integer value for the median of the numbers?

14. 36% of $\frac{1}{3}$ of 155 is the same as 10% of $\frac{1}{8}$ what number?

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15. Each arc in the diagram is a semicircle. What fraction of the largest semicircle is shaded?



16. The fifteen mathletes from Genius Middle School are lining up for their math field day photo. The three Tri Team Attack participants want to stand together in line, as do the three Tea Party Relay participants. Of course, the two Dynamic Duo participants also want to stand together, as do the two Win Lose or Draw participants. Taking these preferences into consideration, in how many ways can the fifteen Genius Middle School mathletes be arranged in a line?
17. A sum of money is to be distributed among Abe, Bonnie, Carter, and Donna in the proportion of $5 : 2 : 4 : 3$. If Carter gets \$1500 more than Donna, what is Bonnie's share?
18. At a farmer's market, Ella buys three apples and two oranges and pays \$3.10. Changing her mind, she exchanges one of her oranges for another apple and pays an additional \$0.15. What is the price of a single apple?
19. You select at random two distinct numbers from the set $\{1, 2, 3, 4, 5, 6, 7, 8\}$. What is the probability that the sum of the two numbers selected is less than 6? Give your answer as a common fraction.
20. Thomas's favorite number is 23. He also likes all numbers with both a 2 and a 3, with the 2 before the 3 (such as 231 or 253). Thomas's second favorite number is the 23rd such number. What is Thomas's second favorite number?



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Round 1 Answers

1. 168,168
2. 8.5
3. 280
4. 30°
5. 1
6. 5
7. Friday
8. $19/39$
9. 30
10. 32
11. 20
12. -1
13. 21
14. 1488
15. $1/3$
16. 52,254,720
17. \$3000
18. \$0.68 or 68 cents
19. $1/7$
20. 423